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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/407,307	09/29/1999	TADASHIGE IWAO	1359.1013	2590

21171 7590 12/01/2004

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EXAMINER

NGUYEN, VAN H

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/407,307

Applicant(s)

IWAQ ET AL.

Examiner

VAN H NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to the request for continued examination filed October 29, 2004.
2. Claims 1-11 are currently presented in this application. Claims 1 and 10 have been amended. Claim 11 has been added. Claims 1, 10, and 11 are independent claims.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 30, 2004 has been entered.

Claim Objections

4. Claim 11 is objected to because of the following informalities:
“the action of *third table*” (claim 11, line 80) should read “the action of *the third object*”
Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The term “substantially” (in claim 11, line 8) renders the claims indefinite.
- b. The language “wherein, if there are a plurality of competing objects that can provide an action in response to the task request by executing an action in response to the requested task when receiving a bid awarding notification, the selected object, of which task processing is requested, is determined by a bidding system” (in claims 1 and 10) is unclear.
- c. Dependent claims 2-9 are rejected for fully incorporating the deficiencies of their base claim.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-9 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

- a. Claim 1 recites an apparatus in the preamble only, the body of the claim merely contains programming steps. Therefore, the claim is a program per se and is not tangibly embodied and therefore not an "apparatus".
- b. Dependent claims 2-9 are rejected for fully incorporating the deficiencies of their base claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in sec. 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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10. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chavez et al.** "*Challenger: A Multi-agent System for Distributed Resource Allocation*" 1997 ACM, pp. 323-331 in view of **Gray et al.** (U.S.5,802,396).

11. **As to claim 11:**

- a. Chavez teaches the invention substantially as claimed including a method of object collaboration for three or more objects (*e.g., agents; see the abstract*) dispersed over a network (*e.g., a network; see the abstract*) in an objected-oriented system (*e.g., Challenger, a multi-agent system; see the abstract*), where the objects comprise object-oriented data structures (*e.g., wrote it in Java; p. 325, sec. 4.1, the 7th para.*), where any one of the objects can be a first object initiating a task (*e.g., each object is responsible for both assigning tasks originating on its machine; p. 324, sec. 3.2, the 1st para.*), where a second object is capable of accomplishing the task, where a third object is also capable of accomplishing the task (*e.g., all agents are identical in that they have the exact same behavior; p. 324, sec. 3.2, the 1st para.*), and where the action of the second object is substantially different than the action of third object (*e.g., p. 324, sec. 3.2, showing that each of the agents has a different estimated time to complete a job*), the method comprising:
- (i) at the first object (*e.g., the local Challenger agent; p. 324, sec. 3.2, the 2nd para.*) initiating a task (*e.g., a job is originated; p. 324, sec. 3.2, the 2nd para.*) of the first object by sending over the network (*e.g., broadcasts...to all the agents in the network; p. 324, sec. 3.2, the 2nd para.*) a message (*e.g., a*

- request for bids; p. 324, sec. 3.2, the 2nd para.)* indicating the task (*e.g., contains a job id, a priority value; p. 324, sec. 3.2, the 2nd para.)*;
- (ii) at the second object (*e.g., an agent; p. 324, sec. 3.2, the 2nd para.)*), receiving the message (*e.g., receives a request for bids; p. 324, sec. 3.2, the 2nd para.)*), and in response the second object generates a bid message with a bid value with which the second object bids on potentially performing its action to accomplish the task indicated by the message (*e.g., responds with a bid giving the estimated time to complete the job; p. 324, sec. 3.2, the 2nd para.)*),
- (iii) at the third object (*e.g., an agent; p. 324, sec. 3.2, the 2nd para.)*), receiving the message (*e.g., receives a request for bids; p. 324, sec. 3.2, the 2nd para.)*), and in response the third object generates a bid message with a bid value with which the third object bids on potentially performing its action to satisfy the task indicated by the message (*e.g., responds with a bid giving the estimated time to complete the job; p. 324, sec. 3.2, the 2nd para.)*), and
- (iv) at the first object, receiving the bid message of the second object and receiving the bid message of the third object (*e.g., the originating agent receives all the bids from all the agents; p. 324, sec. 3.2, the 2nd para.)*), and in response using the bid values to determine which of either the second or third object is to perform its respective action to accomplish the task initiated by the first object (*e.g., the originating agent evaluates all the bids it has received and assigns the task to the best bidder, i.e. the one which returned the lowest estimated completion time; p. 324, sec. 3.2, the 2nd para.)*).

- b. Chavez, however, does not specifically teach “action tables”, “each action table comprises request-action pairings”, and “referring to its action table and the action.”
- c. Gray teaches action tables (*e.g., goal directories 33; col.10, line 22 and fig. 4A*), each action table comprises request-action pairings (*e.g., goal and procedure, see goal directory 33 in fig. 4A*), and referring to its action table (*e.g., each agent has access to its own goal directory, which contains a list of goals understood by the agent; col.10, lines 22-24 and fig. 4A*) and the action (*e.g., a procedure needed to accomplish each goal; col.10, lines 22-24 and fig. 4A*).
- d. It would have been obvious to one of ordinary skill in the art to combine the teachings of Gray and Chavez because Gray’s teaching would have provided the capability for greatly improving resource allocation by minimizing mean flow time, the average time from when a job is originated to when it is completed, in Chavez’s system.

15. **As to claim 1:**

- a. It is directed to an apparatus for performing the method of claim 11, and is similarly rejected under the same rationale.
- b. Additionally, Chavez further teaches a bid awarding notifying portion for notifying the selected object of a bid awarding determination (*e.g., assigns the task to the best bidder...cancel messages are sent to all other agents; p. 324, sec. 3.2, the 2nd para.*), and wherein, if there are a plurality of competing objects (*e.g., the agents; p. 324, sec. 3.2, the 2nd para.*) that can provide an action in response to the task request by executing an action in response to the requested task when

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receiving a bid awarding notification (*e.g., p. 324, sec. 3.2, the 2nd para. show the agents indicates their ability to complete the task by sending bids to the originating agent*).

- c. While Chavez teaches the selected object is determined by the first object, Chavez does not specifically teach “determining by a bidding system.”
- d. Gray teaches determining by a bidding system (*e.g., fig. 1A shows the selected agent 4 is determined by the blackboard bidding system 3*).
- e. It would have been obvious to one of ordinary skill in the art to combine the teachings of Gray and Chavez because Gray’s teaching would have provided the capability for greatly improving resource allocation by minimizing mean flow time, the average time from when a job is originated to when it is completed, in Chavez’s system.

12. **As to claim 2:**

Chavez teaches the bid awarding portion uses, as one bid determining parameter, a communication time that is necessary for communication between the task initiator object and the objects sending the bidding message (*e.g., a bid giving the estimated time to complete the job; p. 324, sec. 3.2, the 2nd para.*), and preferentially awards a bid to an object that has a short communication time between objects (*e.g., assigns the task to the best bidder, i.e. the one which returned the lowest estimated completion time; p. 324, sec. 3.2, the 2nd para.*).

13. **As to claim 3:**

Chavez teaches the bid awarding portion uses, as one bid determining parameter, an empirical value of past processing performances for similar tasks of the objects sending a bidding message (*e.g., when a job is assigned to the winning bidder, record their bid; p. 329, sec. 5.3, the 4th para.*), and preferentially awards a bid to an object that is expected to have a high processing portion selects an object that is good at processing the requested task, and preferentially awards a bid to an object that is expected to have a high processing performance for the request task (*e.g., "penalize" those agents which consistently underestimate job completion times, while "awarding" those agents which consistently overestimate; p. 329, sec. 5.3, the 3rd para.*).

14. As to claim 4:

Chavez teaches in a bidding value, a bidding parameter that shows its own condition with respect to a task for which the bidding portion returns a bidding message (*e.g., a bid giving the estimated time to complete the job; p. 324, sec. 3.2, the 2nd para.*), and the bid awarding portion determines a bid-winning object using the bidding value as one bid determining parameter (*e.g., the originating agent evaluates all the bids it has received and assigns the task to the best bidder, i.e. the one which returned the lowest estimated completion time; p. 324, sec. 3.2, the 2nd para.*).

15. As to claim 5:

Chavez teaches the bidding portion sends the bidding message using, as one bidding parameter, processing resources that can be assigned to a requested task

processing (*e.g.*, p. 324, sec. 3.2, the 2nd para. shows after receiving "request for bids" from the originating agent, the agents in the network respond to the originating agent by sending bids indicating their resources to be used to process the task), and the bid awarding portion selects an object having a bidding value indicative of large processing resources that can be assigned, and preferentially awards a bid to the selected object as the bid-winning object (*e.g.*, "awarding" those agents which consistently overestimate; p. 329, sec. 5.3, the 3rd para.).

16. **As to claim 6:**

Chavez teaches the bidding portion sends the bidding message using, as one bidding parameter, an object load ratio showing a ratio of the already assigned processing resources to the bidding object's original processing resources (*e.g.*, call the ratio R_{a-to-p} ; p. 329, sec. 5.3, the 5th para.), and the bid awarding portion selects, from the object load ratios in the bidding values, an object having a small load that is already assigned, and preferentially awards a bid to the selected object as the bid-winning object (*e.g.*, p. 329, sec. 5.3, the 4th shows an object load ratio is used to assign a task to the winning bidder).

17. **As to claim 7:**

Chavez teaches the bidding portion sends the bidding message using, as one bidding parameter, a computer load ratio indicating a ratio of the already assigned processing resources to the processing resources of a computer that is executing the bidding object (*e.g.*, call the ratio R_{a-to-p} ; p. 329, sec. 5.3, the 4th para.), and the bid awarding portion selects, from the computer load ratios in the bidding

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values, an object that is executed on a computer having a small load that is already assigned, and preferentially awards a bid to the selected object as the bid-winning object (*e.g., p. 329, sec. 5.3, the 4th shows a computer load ratio is used to assign a task to the winning bidder*).

18. As to claim 8:

Chavez teaches the bidding portion sends the bidding message using, as one bidding parameter, a skillfulness at the task, which is based on resources available to the bidding object (*e.g., p. 324, sec. 3.2 the 2nd shows agents use information contained in the request for bids message to calculate estimated time to complete the job before they send bids to the originating agent*), and the bid awarding selects an object that is good at processing the requested task, and preferentially awards a bid to the selected object as the bid-winning object (*e.g., assigns the task to the best bidder; p. 324, sec. 3.2, the 2nd para.*).

19. As to claim 9:

Chavez teaches the task initiator object has a bidding portion that generates a bidding message in response to the requesting message sent by the task initiator object (*e.g., p. 324, sec. 3.2, the 2nd para. shows "the local Challenger agent broadcasts a "request for bids" to all the agents in the network including itself and all the agents respond by returning their bids*), and the bid awarding portion processes the bid awarding selecting an object in accordance with bidding messages sent from both other objects and a bidding messages from the own terminal's bidding portion and selects the most appropriate object for the task

processing from among all objects including itself (*e.g., p. 324, sec. 3.2, the 2nd para. shows assigning the task to the best bidder by evaluating all the bids from the agents including the local Challenger agent; p. 324, sec. 3.2, the 2nd para.*).

20. **As to claim 10:**

- a. It is directed to a computer-readable storage for implementing the method of claim 11, and is similarly rejected under the same rationale.
- b. Additionally, Chavez further teaches a bid awarding notifying portion for notifying the selected object of a bid awarding determination (*e.g., assigns the task to the best bidder...cancel messages are sent to all other agents; p. 324, sec. 3.2, the 2nd para.*), and wherein, if there are a plurality of competing objects (*e.g., the agents; p. 324, sec. 3.2, the 2nd para.*) that can provide an action in response to the task request by executing an action in response to the requested task when receiving a bid awarding notification (*e.g., p. 324, sec. 3.2, the 2nd para. shows the agents indicates their ability to complete the task by sending bids to the originating agent*).
- c. While Chavez teaches the selected object is determined by the first object, Chavez does not specifically teach “determining by a bidding system.”
- d. Gray teaches determining by a bidding system (*e.g., fig. 1A shows the selected agent 4 is determined by the blackboard bidding system*).
- e. It would have been obvious to one of ordinary skill in the art to combine the teachings of Gray and Chavez because Gray’s teaching would have provided the capability for greatly improving resource allocation by minimizing mean flow

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time, the average time from when a job is originated to when it is completed, in Chavez's system.

Response to Arguments

21. Applicant's arguments filed August 29, 2004 have been considered but are moot in view of the new ground(s) rejection.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Arnold et al. (U.S. 5551035) teaches "Method and apparatus for inter-object communication in an object-oriented program controlled system."

- Gray et al. (U.S. 6795969) teaches "Transfer of basic knowledge to agents."

- Veeramani teaches "Task and resource allocation via auctioning" proceedings of the 1992 Winter Simulation Conference, pp.945-954.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAN H. NGUYEN whose telephone number is (571) 272-3765. The examiner can normally be reached on Monday-Thursday from 8:30AM - 6:00PM. The examiner can also be reached on alternative Friday.
24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756.

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25. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:

Commissioner for patents

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11/22/04



Van H. Nguyen